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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LUONG, VINH

ART UNIT

PAPER NUMBER

3682

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,174

Applicant(s)

JACOBS ET AL.

Examiner

Vinh T. Luong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 6,16 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-15,17-19 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


Vinh T. Luong
Primary Examiner

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

1. Applicant's election without traverse of the species of Figs. 1-4, 6, and 7 in the reply filed on December 12, 2005 is acknowledged.
2. Claims 6, 16, and 20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on December 12, 2005.
3. The drawings are objected to because:

(a) The drawings are inconsistent with the specification, *e.g.*, paragraph [0023] of the specification describes the reaction wheel structure 216, however, the drawings do not show the referential numeral 216; and

(b) The cross section, such as, Fig. 3 or 5 must be set out and draw to show all of the materials as they are shown in the view from which the cross section was taken. 37 CFR 1.84(h)(3). For example, the materials of the races 304, 306, 308 are required to be shown by proper hatchings.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The disclosure is objected to because of the following informalities: the specification is inconsistent with the drawings, *e.g.*, paragraph [0023] of the specification describes the reaction wheel structure 216, however, the drawings do not show the referential numeral 216. Appropriate correction is required.

5. Claims 15 and 19 are objected to because of the following informalities: the claim contains typographical or grammatical error, *e.g.*, the recitation "wherein piezodynamic damping spacer comprises" should have been changed to "wherein the piezodynamic damping spacer comprises." Appropriate correction is required.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Perni et al. (EP 1 134 443 A2 cited by Applicant).

Regarding claim 1, Perni teaches a vibration damping device, the vibration damping device comprising:

a) a piezodynamic damping spacer 22, the piezodynamic damping spacer 22 coupled to a bearing 10 (Figs. 1, 6, and 7) in a momentum control device 2 (Fig. 1), the

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piezodynamic damping spacer 22 configured such vibrations in the bearing 10 are absorbed by the piezodynamic damping spacer 22 and converted to electrical energy; and

b) a tuning system 4-6 (Fig. 8) electrically coupled to the piezodynamic damping spacer 22, the tuning system 4-6 providing selective control of a resonant frequency of the vibration damping device such that the vibration damping device absorbs vibrations in a selected frequency range. *Ibid.*, paragraph [0028] and claims 1-14.

Regarding claim 2, the piezodynamic damping spacer 22 is located adjacent the bearing 10 (Figs. 1, 6, and 7).

Regarding claim 3, the bearing 10 comprises a duplex bearing pair 43 and 44 and wherein piezodynamic damping spacer 22 is located between the duplex bearing pair 43 and 44.

Regarding claim 4, the piezodynamic damping spacer 22 comprises a ring shaped spacer 22 having a thickness as seen in Fig. 1.

Regarding claim 5, the piezodynamic damping spacer 22 comprises a piezoelectric material. See paragraph [0019].

Regarding claim 7, the momentum control device 2 comprises a reaction wheel 2 (Fig. 1).

Regarding claim 8, the momentum control device 2 comprises a control moment gyroscope 2.

8. Claims 1, 9-15, 17-19, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kudo et al. (US Patent No. 6,286,374 B1).

Regarding claim 1, Kudo teaches a vibration damping device, the vibration damping device comprising:

a) a piezodynamic damping spacer 22, 23 the piezodynamic damping spacer 22, 23 coupled to a bearing 10 in a momentum control device 100, the piezodynamic damping spacer 22, 23 configured such vibrations in the bearing 10 are absorbed by the piezodynamic damping spacer 22, 23 and converted to electrical energy; and

b) a tuning system (Figs. 2 and 3) electrically coupled to the piezodynamic damping spacer 22, 23, the tuning system providing selective control of a resonant frequency of the vibration damping device such that the vibration damping device absorbs vibrations in a selected frequency range. *Ibid.*, col. 6, line 18 through col. 10, line 35 and claims 1-14.

Regarding claim 9, the tuning system includes an operational amplifier 35, 38, 39 (Fig. 2) to implement a tunable inductor to provide the selective control of the resonant frequency.

Regarding claim 10, the tuning system includes an input (Fig. 2) to receive sensor data (of sensor 29 in Figs. 2 and 9) indicating an operational speed of the momentum control device.

Regarding claim 11, the tuning system adjusts the resonant frequency in response to the sensor data. See, *e.g.*, Fig. 3.

Regarding claim 12, a vibration sensor circuit (Fig. 2) is electrically coupled to the piezodynamic damping spacer 22, 23 to measure vibrations in the bearing 10.

Regarding claim 13, the vibration sensor circuit (Fig. 2) inherently provides a vibration frequency output to tuning circuit, the vibration frequency output proportional to a frequency of the measured vibrations in the bearing 10.

Regarding claim 14, Kudo teaches a vibration damping device for reducing vibrations in a momentum control device 100, the vibration damping device comprising:

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a) a piezodynamic damping spacer 22, 23, the piezodynamic damping spacer 22, 23 coupled to a bearing 10 in the momentum control device 100, the piezodynamic damping spacer 22, 23 configured such that vibrations in the bearing 10 are absorbed by the piezodynamic damping spacer 10 and converted to electrical energy;

b) a sensor circuit (Fig. 2), the sensor circuit electrically coupled to at least a portion of the piezodynamic damping spacer 22, 23 to measure the vibrations absorbed by the piezodynamic damping spacer 22, 23, the sensor circuit providing a vibration frequency output proportional to a measured frequency of the vibrations (Fig. 3); and

c) a tuning system (Figs. 2 and 3) electrically coupled to the piezodynamic damping spacer 22, 23, the tuning system receiving the sensor output and providing selective control of a resonant frequency of the vibration damping device, the tuning system adjusting the resonant frequency of the vibration damping device such that the vibration damping device efficiently absorbs vibrations in the measured frequency of the vibrations. Ibid., col. 6, line 18 through col. 10, line 35, and claims 1-14.

Regarding claim 15, the piezodynamic damping spacer comprises a ring shaped spacer 23 having a thickness, and wherein the piezodynamic damping spacer 23 absorbs the vibrations by changes in the thickness.

Regarding claim 17, the tuning system includes an operational amplifier 31, 35, 38 (Fig. 2) to implement a tunable inductor to provide the selective control of the resonant frequency.

Regarding claim 18, Kudo teaches a vibration damping device for reducing vibrations in a momentum control device 100, the vibration damping device comprising:

a) a piezodynamic damping spacer 23, 22, the piezodynamic damping spacer 23, 22 coupled to a bearing 10 in the momentum control device 100, the piezodynamic damping spacer 23, 22 configured such that vibrations in the bearing 10 are absorbed by the piezodynamic damping spacer 23, 22 and converted to electrical energy;

b) a sensor input 29 (Fig. 2) to receive sensor data indicating an operational speed of the momentum control device 100; and

c) a tuning system (Figs. 2 and 3) electrically coupled to the piezodynamic damping spacer 23, 22, the tuning system receiving the sensor data and providing selective control of a resonant frequency of the vibration damping device in response to the sensor data, the tuning system adjusting the resonant frequency of the vibration damping device such that the vibration damping device efficiently absorbs vibrations created by the momentum control device at the operational speed.

Regarding claim 19, the piezodynamic damping spacer 23 comprises a ring shaped spacer 23 having a thickness, and wherein the piezodynamic damping spacer 23 absorbs the vibrations by changes in the thickness.

Regarding claim 21, the tuning system includes an operational amplifier 31, 35, 38 to implement a tunable inductor to provide the selective control of the resonant frequency.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re*

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Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-5, 7, 8, 14, and 15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5, 7, 8, 17, and 18 of copending Application No. 10608176 (hereinafter Appl.'176). Although the conflicting claims are not identical, they are not patentably distinct from each other because the two applications recite essentially same structures. In fact, Applicant apparently uses different terminology in order to claim essentially the same invention. *In re Griswold*, 150 USPQ 804 (CCPA 1966). For example, see the comparison of claim 1 of this application and claim 1 of Appl.'176 below:

<u>Common</u>	<u>Appl.'174</u>	<u>Appl.'176</u>
a piezodynamic spacer		
a bearing		
	tuning system	control system

The tuning system claimed in this application inherently is the control system since when the tuning system absorbs the vibrations, it inherently selectively controls the preload on the bearing. This fact is well known as seen, e.g., US Patent No. 6,286,374 issued to Kudo and other references cited in the record. It would have been obvious to one having ordinary skill in the art

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to use the tuning system claimed in this application as the control system claimed in Appl.'176 as taught or suggested by common knowledge in the art.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Takamizawa et al. (abstract), Yamada (Fig. 9), Matsuzaki et al. (Figs. 1-10), Raichle (Figs. 1 and 2), Kawasaki (piezoelectric ring 6), and Furuhashi (piezoelectric rings 15 and 16).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinh T. Luong whose telephone number is 571-272-7109. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luong

January 18, 2006



Vinh T. Luong
Primary Examiner